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The Commonwealth of Massachusetts

SPECIAL REPORT

OF THE

DEPARTMENT OF NATURAL RESOURCES

RELATIVE TO

THE ADVISABILITY OF PRESERVING THE WET- LANDS, SO CALLED, OF THE NEPONSET RIVER VALLEY FOR CERTAIN PURPOSES

UNDER CHAPTER 21 OF THE RESOLVES OF 1963.

JANUARY, 1964

BOSTON

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The Commonwealth of Massachusetts

LETTER OF TRANSMITTAL.

DEPARTMENT OF NATURAL RESOURCES,
15 ASHBURTON PLACE, BOSTON 8, January 29, 1964.

To the Honorable the Senate and House of Representatives.

Under chapter 21 of the Resolves of 1963, the Department of Natural Resources, hereinafter referred to as the "Department", was authorized and directed to make a study of the Neponset River Valley, for the purpose of determining the advisability of preserving the wetlands, so called, including swamps and marshlands in said Valley, for conservation, recreation, or other necessary and desirable purposes. Said Department is to file the results of their study, together with recommendations, with the Clerk of the House of Representatives, on or before January 29, 1964. The resolve in question reads as follows:

Resolved, That the Department of Natural Resources is hereby authorized and directed to make a study of the Neponset River Valley for the purpose of determining the advisability of preserving the wetlands, so called, including swamps and marshlands in said Valley, for conservation, recreation, or other necessary and desirable purposes. Said Department shall consult with the appropriate officers and boards of the municipalities and the counties affected — may hold public hearings — and may expend for engineering, technical and clerical assistance and other expenses, such sums as may be appropriated therefor. It shall report from time to time to the general court the results of its study, together with its recommendations, if any, together with drafts of legislation necessary to carry such recommendations into effect, and estimated costs thereof, by filing the same with the Clerk of the House of Representatives, and shall file its final report on or before the last Wednesday of January, nineteen hundred and sixty-four.

No sum was appropriated for this study. We enclose the report of the study, recommendations, and a draft of legislation which would serve to put these recommendations into effect.

Respectfully submitted,

CHARLES H. W. FOSTER,
*Commissioner,
Department of Natural Resources.*

The Commonwealth of Massachusetts

REPORT

OF THE

DEPARTMENT OF NATURAL RESOURCES

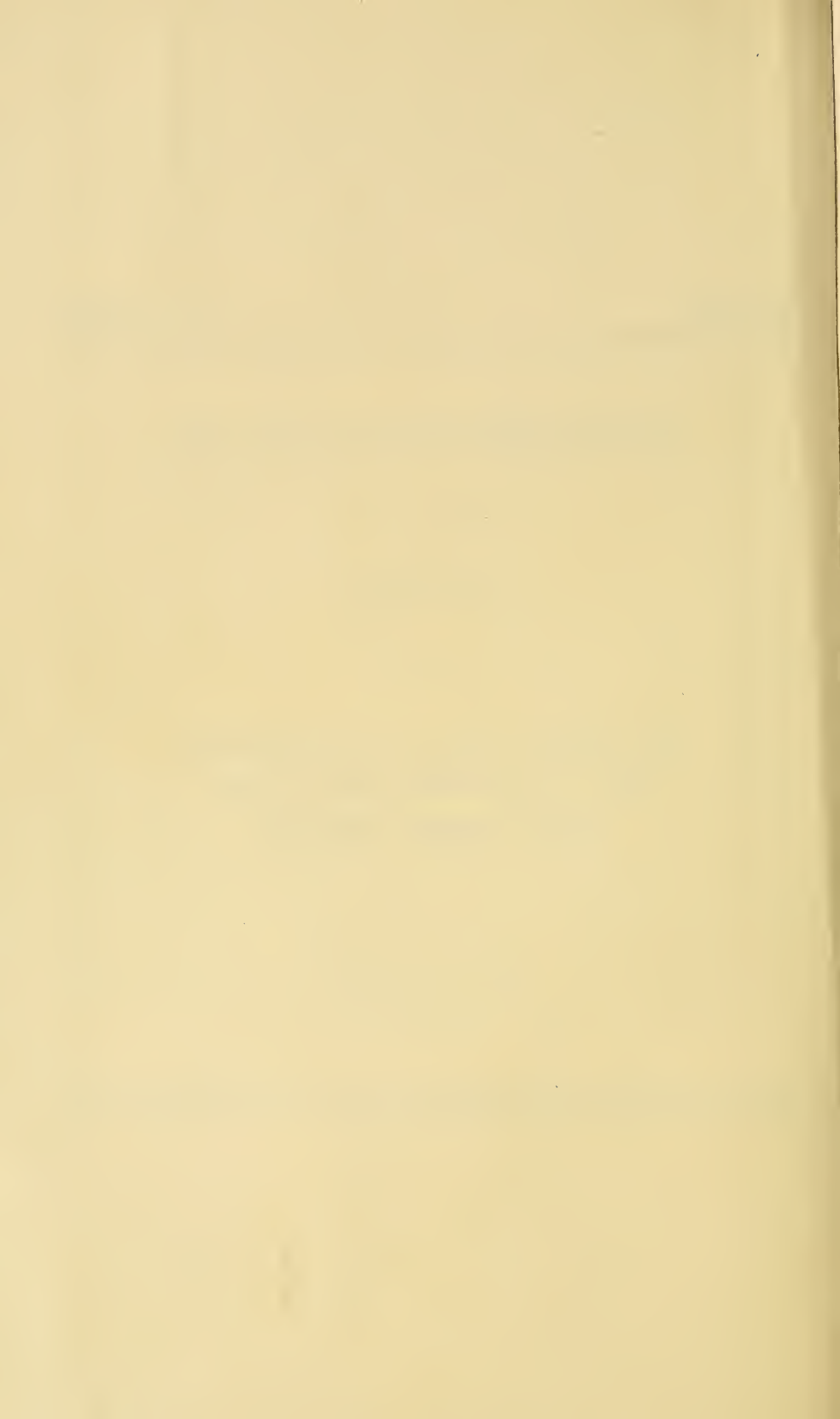
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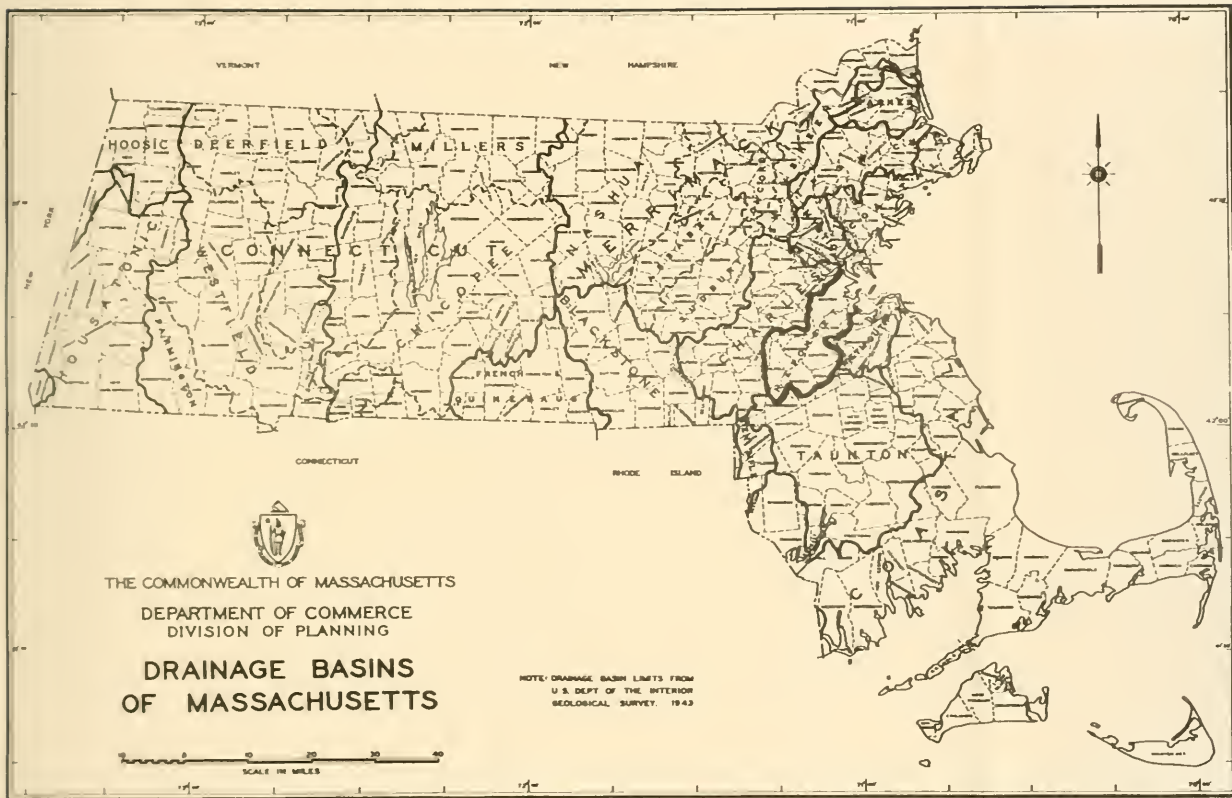
NEPONSET RIVER VALLEY

January 29, 1964



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PURPOSE OF THE STUDY.

The Department of Natural Resources was duly authorized and directed to do a study of the advisability of preserving the wetlands, so called, of the Neponset River.

The construction of Interstate 95, the straightening, deepening and widening of the Neponset River, the problems of increased industrial and residential development, demand for recreation areas and for open space, were the major considerations connected with the wetlands of the Neponset River.

The tidal lands, the Fowl Meadow and the uplands, although interrelated, were treated separately wherever possible.

An attempt was made to develop regional recommendations, as the problems of the Neponset River are regional in character. Recommendations were separated by town, region and commonwealth concerns, where it seemed advisable.

STUDY METHODS.

The following methods were used to gather as much information as possible on the Neponset River drainage area in the time allowed for the study.

Public Meetings.

A series of three meetings were held with local interests within the Neponset River Basin Ad Hoc Commission (League of Women Voters), conservation commissions of Milton, Dedham, Sharon, Westwood, Canton, Walpole, Foxborough and Milton, the Neponset Reservoir Corporation, Tileston & Hollingsworth Company, Bird & Son, Inc., Hollingsworth & Vose Company and the Neponset Valley Trust.

Published Materials.

Materials known to exist, were gathered and compiled. The material was used as background information and much of it was incorporated into the study. Master plans of towns within the drainage were used, studies of the Massachusetts Department of Public Works, Metropolitan District Commission, Water Resources

Commission, Natural Resources and Division of Fisheries and Game were examined and various material supplied by local conservation commissions and private industry were incorporated into the study.

Personal Interviews.

Personal interviews were extensively used to get up-to-date information on matters affecting the Neponset River System from private and governmental groups. The U. S. Soil Conservation Service, through its district office in Norfolk County and the state office in Amherst, were most helpful. It is impossible to thank each individual and agency that gave freely of their time to make the completion of the study possible. The study would have faced insurmountable problems without their assistance.

Field Studies.

Extensive examinations were made of the Fowl Meadow from Quincy to Sharon by the study leader. On the request of the Walpole Conservation Commission, Traphole Brook was examined in detail. A field tour, under the joint sponsorship of local interests and the Water Resources Commission, was held in the Fall of 1963, to examine specific problems of land use, domestic and industrial water supply problems, water pollution, conservation concerns, stream dredging and Interstate 95 construction. Field technicians of the Massachusetts Department of Natural Resources were used primarily to gather land use information.

Base Maps.

U. S. Geological Survey topographic maps, at a scale of 1:24000 or one inch equals 2,000 feet, were used to place land use material on, from the various sources. A dot grid was used to determine acreages. Aerial photographs taken in 1952 were felt to be too out of date to be of much value. Study maps are on file with the Department of Natural Resources. Maps included with the study are overlays of topographic or road maps.

THE HISTORY OF THE NEPONSET RIVER DRAINAGE.

This was an area of Indian settlement which, undoubtedly, was due to abundant supplies of food and clothing provided by the forests, streams, ponds and ocean. Early white settlers found abundant supplies of wood for fuel and tanning, soils suitable for

the raising of crops, adequate water for domestic use and for power and even supplies of bog iron. Very early in the settlement of the drainage, sections of the Neponset River and its tributaries were dammed to provide adequate water for power. The East Branch in Canton, the Neponset River in Walpole and the Mattapan-Milton section of the river gave an adequate head of water for power needs and ample supplies for processing. By the 1900's, agriculture had begun a rapid decline and cheaper electric power made water-power less important. However, the need for processing water increased. The demand for land for residential purposes continued a steady increase until after World War II. With the development of Route 128 and the shift of industry from the city to the suburbs, Milton, Dedham, Canton, Westwood, Norwood and Walpole became involved in massive land development. With the development of Route 24 and the Southeast Expressway, practically all towns within the watershed began to lose large acreages of open land to residential and industrial expansion. The Neponset River continues to be an industrial river from Walpole to Milton due to industrial needs for processing water. Pollution continues to be primarily waste materials of an organic and inorganic nature. The Neponset River drainage system is an important part of domestic water systems of all towns in the central and southern sections. Recreational needs of most towns in the drainage area were adequately supplied by large private ownerships which were seldom closed to general public use and by the far-sighted acquisition of the Blue Hills Reservation and the Neponset River Reservation.

A DESCRIPTION OF THE NEPONSET VALLEY DRAINAGE AREA.

The Neponset River drainage has the shape of a paper bag clutched close to the top of the bag. The top of the bag is made up of the tidal area leading into Dorchester Bay. Quincy, Milton and the southeast portion of Boston make up this section. The clutched section of the bag is made up of the narrow section extending from Readville to Milton Lower Falls. The body of the bag is made up of the communities of Dedham, Westwood, Dover, Medfield, Norwood, Walpole, Foxborough, Sharon, Stoughton, Canton, Randolph and a portion of Milton.

The drainage area, excluding that portion which is included with the flow through Mother Brook, is 124 square miles. If the Mother

Brook drainage (including the 66.2 square miles of the Charles River watershed that is, under law, available to the Neponset River) is added, the total drainage is 180.34 square miles. A large portion of this drainage area is made up of swamps, marshes, streams and ponds. In fact, the wetland acreage makes up 14 per cent of the total land area within the drainage. This does not include the tidal wetlands.

Fortunately, in most instances, the river slopes are slight to moderate and the topography of the land is gently rolling. Only in the vicinity of the Blue Hills is the slope steep for any distance.

The wetlands can be separated into three specific areas — the tidal wetlands — the Fowl Meadow — and the upland swamps and ponds.

The soils of the drainage are, for the most part, gravels and sands, or muck and peat mixtures. Outcroppings of bedrock appear to be confined to areas in Dedham, Sharon, Milton and Canton. There is even one unique outcrop of basalt in the Fowl Meadow south of Dedham Street in Canton.

Residential concentrations, until recently, were centered around industry and the commercial centers. This meant that south of Route 128, such communities as Canton, Walpole and Norwood were located close to the major tributaries and between the uplands and the Fowl Meadow. The uplands were relatively undeveloped. This picture is rapidly changing due to better road systems and the pressures of population. Excluding Boston, the population of the remaining towns within the drainage system was 242,000 in 1960.

FUTURE PROBLEMS OF THE NEPONSET RIVER DRAINAGE.

Dredging of the Neponset River.

Under chapter 56 of the Resolves of 1955, authorization was given to continue a study of the drainage problem of certain lands adjacent to the Neponset River. The resulting report, known as House document No. 3014, developed the engineering details and cost estimates for deepening and widening of the Neponset River from the Baker Chocolate plant to Traphole Brook in Norwood. The work will cover approximately 10 miles through the Fowl Meadow. The straightening of the channel will decrease the length of the river from 9.3 to 7.8 miles through the Fowl Meadow. The existing water level will be lowered 3 feet between Traphole Brook and the

Mattapan Mills dam. The normal channel will be widened from Traphole Brook to Neponset Street to approximately 60 feet at a minor flood level. The auxiliary flood channel to be developed on both sides of the normal channel will increase the width to approximately 160 feet in this area. From Neponset Street to Milton Street the normal channel will average 100 feet in width at a minor flood level. The auxiliary flood channels will increase the overall width to approximately 300 feet. It should be noted that the auxiliary channels will be at existing Fowl Meadow levels, for the most part. No building or filling would be allowed within this stream alteration area. With the loss of storage in the Fowl Meadow, the peak flows will be twenty per cent higher. This means that twenty per cent more water will have to be released through the Mattapan Mills dam to tidal areas east of Milton Lower Falls. It is proposed that all excavated material will be placed behind the auxiliary flood channel.¹

It is interesting to note that the Engineer's Report attached to House, No. 3014 of June, 1955, preceded the "Diane" storm of 1955 by approximately 3 months. Plotted against the bank profile in the Engineer's Report, the water was approximately four feet over the existing banks of the Neponset River.

The 4 million dollar project for flood control, which was a direct result of House, No. 3014, 1955, is now under way. The first phase, between the Walter Baker Chocolate Company and the Mattapan Mills dam, is almost completed. This dredging, widening and straightening project is expected to be completed by the summer of 1965, to its terminus at Traphole Brook.

The most obvious effect of lowering the water level in the Fowl Meadow throughout its entire length, will be to make the Fowl Meadow more attractive for the development of industry. However, this necessitates the removal of peat which varies in depth from one to thirty feet.² The average depth may be more in the range of five feet. Westwood, Canton and Norwood have zoned most of the Fowl Meadow for industry. There is little doubt that the completion of Interstate 95 will make this area extremely attractive. The greatest concentration of interest will be adjacent to the interchanges at Neponset Street and Route 128. The following is the industrial acreage potential by townships in the Fowl Meadow.

¹ House, No. 3014, Report of a Joint Board on the Study of the Neponset River, June 30, 1955, pp. 8-21.

² Notes from U. S. Geological Survey, Boston.

Industrial Acreage (Fowl Meadow).

TOWNSHIP.	Acreage.
Canton	772
Westwood	86
Norwood	1,212
Total	2,070*

* This only includes that land in the Fowl Meadow below the 50 foot contour.

Assuming that the average depth of peat is 5 feet and that it will have to be removed and replaced with solid fill, the amount of fill would be 8,228 cubic yards per acre or 17 billion cubic yards to fill 2,070 acres. If industry wished to bring the ground level up to the elevation of the auxiliary flood channel for additional protection, the cubic yardage would have to be increased to 30 billion cubic yards.

In an interview with an industrial group representative, I was informed that it was economically feasible to remove peat and replace with solid fill where peat depths did not exceed 6 feet. As industrial land becomes more limited, it would be feasible to fill on greater peat depths or place structures on piling.

It was also stated that to attempt to build on the peat, even if covered with gravel fill, would be unsuitable for structure stability.

Surface run-off conditions will be altered considerably. The ability of peat soils to hold water is well known. There is no question that the limited flooding which has occurred in the Neponset drainage is due to the great acreage of such soils. The statement was made in the Engineer's Report of House, No. 3014 that "This natural storage acts in much the same manner to reduce flood peaks as some of the artificially constructed flood-control reservoirs now being built on some rivers."¹

It is known that up to 75 per cent of industrially developed areas will have 100 per cent run-off. This is due to the development of structures, storage areas, roads and parking lots. As we can only assume that it is possible to develop the entire Fowl Meadow, a total of 1,550 acres would be under some form of impervious material. Again, if we assume a four-inch rainfall, as occurred in October, 1962, we find that 189 million gallons of water must be diverted into the Neponset River in a period of hours. Under undisturbed meadow conditions, a good portion of this would have been absorbed and released into the river over a period of days or weeks. It should

¹ House, No. 3014 (1955) Engineer's Report p. 19.

also be noted that a storm of this magnitude would be released into the river between Neponset Street, Canton and Route 128, a distance of approximately 3.2 miles. This volume of water is equivalent to a 49-day supply for Tileston & Hollingsworth Company, which depends on river flow for industrial water.

The effect on development on subsurface water volumes and flow is much more difficult to determine. We can recognize that rapid surface run-off will decrease subsurface volumes. The change from peat to gravel fill may alter rate and volume of subsurface flows. This is important, as Canton, Norwood and the Dedham Water Company have wells in the Meadow. The Dedham Water Company also supplies the town of Westwood with water. The 3 foot reduction of water levels due to dredging and the possible reduction due to altered subsurface volumes and movement of water could add to the reduction of available water supplies.

Wildlife and esthetic values of the Fowl Meadow will be drastically altered by the development of the Fowl Meadow from Route 128 to Neponset Street in Canton. Above and below this area, which has been proposed as "Natural Area", or is publicly owned by the Metropolitan District Commission, the reduction of water levels by three feet will affect water-oriented forms of animal and plant life.

Although large areas are now covered with grasses or sedges of various types, there will be a conversion to aspen and other tree forms which are dispersed by wind or birds. Many areas, now open in character, will take on the form of a wooded swamp. It is possible that large areas of purple loosestrife which have been spectacular while in bloom, will diminish in area. Bird and animal species may change, but other species that find the changed conditions of food and cover acceptable, may replace the types found there today.

The straightening of the Neponset River, through the Fowl Meadow, will effectively cut off some of the meanders of the existing river. It is planned to leave the downstream end of the cut-off section open for better drainage of the marsh. It is possible to dike both ends of such meanders and create suitable areas for water-oriented wildlife. It would also be another means of storing water temporarily. This would augment the sustained flow of water, so important to industry, by allowing slow subsurface release of the stored water into the river. The greatest number of meanders occur from just south of Neponset Street to Canton Street. Al-

though this would create exceptional habitat for water-oriented wildlife, the possibility of increased use of the Norwood Airport by company and commercial aircraft of propeller or jet propulsion would create an increased hazard during take-off and landing. However, there are possibilities of this nature south and north of the area just discussed. The U. S. Soil Conservation Service, on the request of the Massachusetts Zoological Society, developed a plan for a series of ponds in the Neponset River Reservation. These ponds would be used as a part of the exceptional educational program of natural science education conducted by the Massachusetts Zoological Society at the Trailside Museum in the Blue Hills Reservation.

The development of these ponds would also serve to increase all forms of water-oriented wildlife. It is possible that the development of the impoundments could be incorporated into the dredging and straightening of the Neponset River in this section.

Interstate 95.

The Southwest Expressway, otherwise known as I-95, will become an actuality within the next two to three years, through the Fowl Meadow to its junction with Route 128. It is proposed to extend I-95 north of Route 128 to a connection with the Inner Belt and thence to a connection with I-95 north of Boston. This highway will be the most direct route from the Boston metropolitan area to the south. As a commercial and tourist route, I-95 will be of the greatest importance to the economy of Massachusetts from north and south.

The Effect of I-95 on the Neponset River.

Interstate 95, which is now under construction from Foxborough to Neponset Street in Canton, will enter the Fowl Meadow, from the south, adjacent to the Norwood-Sharon town line. It will proceed northeasterly through the Fowl Meadow to an interchange approximately 1,000 feet west of the Neponset River at Neponset Street. I-95 will then be extended in a northeasterly direction across the Fowl Meadow to a point approximately 1,500 feet east of where the Neponset River passes under Route 128. (See map.) An interchange will be developed at Route 128.

The most obvious change will be the amount of land needed to develop the road-bed and interchanges. Below is the expected loss based on 50 acres per mile for road-bed and 45 acres per interchange:

Land Use Change in Fowl Meadow (Due to I-95).

TOWNSHIP.	Acreage.
Sharon	35
Norwood	67
Canton	156
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Total	258

The isolation of property by the development of I-95 will create problems for owners and for the township in which the land is located. This is also coupled with land area being cut off by the relocated river. The major problem is located in an area extending from a point approximately 3,000 feet north of Neponset Street to the southernmost point of contact of I-95 and the Fowl Meadow in Norwood. (See map.) Below is a summary of isolated land area created by I-95:

Isolated Land Area by Township.

TOWNSHIP.	Acreage.
Sharon	160
Norwood	53
Canton	3*
<hr/>	
Total	216

* The relocated river at Neponset Street will isolate an additional 37 acres.

The effect of I-95 on subsurface and surface drainage may be of some magnitude. As the peat will have to be removed and solid fill used for the road base, the result will be an earthen dike approximately 3.8 miles in length from its southernmost contact with the Fowl Meadow to its junction with Route 128. The extent of alteration of surface and subsurface drainage is difficult to determine due to the lack of knowledge of drainage patterns. However, we can assume that most drainage is from the sides of the Meadow to the Neponset River and from south to north along the entire Fowl Meadow.

South of Neponset Street, the surface drainage will be divided in half by I-95. From Neponset Street to the junction of I-95, with upland just south of Dedham Street in Canton, a dike of approximately 4,000 feet will be placed across the Meadows in a northeast-southwest direction. Subsurface drainage east of I-95, in this section, may be impeded. The effect on the wells, just south of Dedham

Street and west of I-95 in Canton, cannot be determined, but they should be watched carefully for reduction of water levels. Between Dedham Street, Canton, and Route 128, I-95 will create a 3,000 foot dike. East of I-95 and west of Elm Street, there are 100 acres of wooded swamp which may develop impeded drainage. It also reduces the old flood plain by approximately 50 per cent. Ponkapoag Brook and two smaller tributaries flow from east to west through this area. Unless properly cared for, minor flooding could occur east of I-95. This area is zoned as industrial land by the Canton Master Plan.¹

Interstate 95 (North of Route 128).

There is no question that the pressure for more adequate access to Boston from the south will demand the extension of I-95 from Route 128 to a junction with the Inner Belt. It will also create some major problems in the Neponset River Reservation. The recommended location for the extension of I-95 north of Route 128, as noted in Excerpts from Inner Belt and Expressway System, Boston Metropolitan Area 1962, Southwest Expressway Study Lines — Sheet #1,² will create a division of the Neponset River Reservation, with the resulting isolation of land area and possible alteration of surface and subsurface drainage.

The recommended route of I-95 will isolate approximately 220 acres of Reservation west of I-95 and east of the river. This area is between Route 128 and the Milton-Canton town line. Unless access can be developed on Route 128 east of the river, or by some form of tunnel under I-95, a large tract of public land will be isolated from all but limited public use. Recreation, natural science education, forest fire suppression, stream maintenance, or M.D.C. sewer line maintenance, will be impossible.

Access should be a part of the design of this portion of I-95. It should be designed to accommodate vehicles required to undertake maintenance or forest fire suppression work. A roadway, new in existence across the Reservation, would be a logical position for the access under I-95. Rapid control of fires in the Reservation will be most important to protect driver visibility on I-95. As most fires are backed by west or southwest winds, any fire developing west of the road will become a hazard to public safety along the entire length of I-95 from Norwood to Readville. The lowering of the

¹ 1959 Master Plan, Summary Report (Canton), Allen Benjamin.

² A Joint Venture Report by Hayden, Harding & Buchanan, Inc., and Maguire & Associates.

water level in the Fowl Meadow will create more fuels which will dry out more rapidly than before. It has been found that divided highways are not a complete deterrent to forest fire spread, as evidenced by the Plymouth fire of 1955 which jumped Route 3 with ease.

The private property, which will be isolated by the recommended route location in the Neponset River Reservation (see map), should be acquired by the Metropolitan District Commission or by the Department of Public Works. The upland, consisting of 44 acres, would be of little value to the private property owners. However, it could be used as a scenic rest area for the south-bound lane of I-95. The elevation of 110 feet would create a natural observation point for the Neponset River Valley. If the design of the recommended route north of Route 128 has not considered the lowering of the road elevation where it passes through a section of upland along the eastern side of the Neponset River Reservation, it would appear to be desirable for the protection of private property values between I-95 and Green Street, Canton. Adequate depression of the road surface would create a noise buffer and eliminate the sight of traffic.

East of I-95 and northeast of the interchange at Route 128, an area of 13 acres of Blue Hills Reservation will be isolated. Impeded drainage may occur in the portion within the Fowl Meadow. It is recommended that the area remain in Metropolitan District Commission ownership, to protect esthetics of the interchange and as a buffer against traffic noise for private property to the east.

Norwood Airport.

The Norwood Airport, located west of the Neponset River in the Fowl Meadow, has the potential for handling aircraft of larger size. The existing runways are 4,000 feet in length, but the Master Plan for the facility calls for the extension of the runways to a total of 6,000 feet in length. The extension would make it possible for short-range jet aircraft to use the airport. The Massachusetts Aeronautics Commission informed this study that it strongly urges that there be no building within 2,500 feet of the end of the runways, due to the extreme noise problem involved with jet aircraft. It would also be a safety factor involved in case of an accident. It was believed, by this study, that a protective strip bordering the entire length of the north-south runway on the westerly side should be maintained as a noise-buffer area. To the east, the same sort of buffer strip should be maintained to the Neponset River. To the

north, a noise buffer should be maintained to the 50-foot contour north of Purgatory Brook. The fact that Airport officials have the right to acquire by eminent domain, suggests that adequate land be acquired soon to insure that such land will remain protected against development. The acquisition of this section of the Fowl Meadow would mean the protection of an extremely important water-holding area of the Neponset River drainage system. This area would comprise approximately 440 acres of wetland. It should be noted that the airport will become an important part of the industrial complex developing south and west of Boston. It will make it possible for executives to visit plants with a minimum of delay in time and expense.

Pollution in the Fowl Meadow Area.

The pollution in the Neponset River through the Fowl Meadow is directly due to Bird & Son and Hollingsworth & Vose, in Walpole. The Foxborough State Hospital also contributes in a limited way to the pollution of the river. Most of the solid waste materials from both industrial plants go into the trunk sewer of the M.D.C. However, to provide adequate industrial processing water for Tileston & Hollingsworth Company at Mattapan, there has to be at least a daily flow of 6 million gallons. It is believed by some industrial representatives, that for any future expansion of production, it will require additional sources of water.

The logical treatment of such wastes from Bird & Son and Hollingsworth & Vose, would be to treat the waste water below Hollingsworth & Vose. However, Hollingsworth & Vose would still be expending considerable sums to improve the water, which is waste water from Bird & Son, just up stream. The possible piping of waste from Bird & Son to below Hollingsworth & Vose, would improve the water quality for Hollingsworth & Vose, but it might seriously alter the volume of water now needed by Hollingsworth & Vose for processing water. If water of sufficient volume could be assured, it would be theoretically feasible to develop treatment. However, until some solution is found which would be economically feasible, the Neponset River, below Bird & Son, will continue to be an industrial river. This will limit the use of the river to the disposal of sewage and its increasing role as a storm sewer. This is not to say that more stringent health regulations, or the future disappearance of industry demanding water for processing, may decidedly improve the river at some time in the future.

Public Hunting.

The stocking of pheasants in the Canton meadow has been carried on for three to four years by the Division of Fisheries and Game. However, the construction of Interstate 95 and the resultant development of industry, will eliminate a considerable acreage for public hunting. This will mean that the existing heavy pressure on this area will be transferred to some other section of the commonwealth.

Upland Considerations.

In the Fowl Meadow, we have been working with an area relatively untouched. In the uplands of the Neponset River drainage, we are working with an area which has been under development for at least 300 years. However, the greatest change in land use is now under-way. Large areas of agricultural and wooded land are ideally suited for house sites. It has been estimated by many of the planners for the towns in the drainage that saturation for development will come some time around the year 2000. Needs for domestic water, sewage disposal, waste disposal, roads and recreation lands, are already creating major problems.

Water Considerations.

There are only three communities within the drainage area that are on the Metropolitan District Supply. The water consumption for 1960 was as follows:

COMMUNITY.	Population (1960).	AVERAGE DAILY.	
		Gallons.	Gallons Per Cap.
Milton . . .	26,375	2,122,200	80
Norwood . . .	24,898	3,158,200	129
Quincy . . .	87,409	9,025,100	103
Total . . .	138,322	14,305,500	

The remaining towns are dependent on community supplies or individual supplies. The following is a partial list of water use:

COMMUNITY.	Population (1960).	AVERAGE DAILY.	
		Gallons.	Gallons Per Cap.
Canton . . .	12,771	1,455,000	114
Dedham & Westwood	34,223	2,821,000	82
Foxborough . . .	10,136	1,385,006	136
Medfield . . .	6,021	369,000	59
Sharon . . .	10,070	704,000	70
Stoughton . . .	16,328	1,551,100	95
Walpole . . .	14,068	1,730,000	123

It is interesting to note that Canton, Stoughton, Walpole, Westwood and Dedham are on the Metropolitan Sewer System. This means that a good portion of the water drawn from local sources is released into the M.D.C. sewer system. In fact, 70 per cent of the average daily consumption of the above eight towns is released into the sewer system. This is a daily loss of 70 per cent of possible recharge of ground water supplies.

Within the next few years, Sharon and Foxborough will develop sewage systems to handle increased populations. In Sharon, it will be possible to become part of the M.D.C. sewer system. Foxborough will undoubtedly develop facilities which do not drain into the Neponset River drainage area. This will mean that 95 per cent of the possible recharge of ground water will not be available.

With the increase of surface run-off from roads, parking areas, buildings and other impervious materials and the increased consumption of water from ground water supplies, there may be some very serious deficiencies in the future. This will include deficiencies of stream flow, especially during drought conditions. The demand for the drainage of swamps for reduction of mosquito problems, will be another means of decreasing the subsurface storage.

The possibility that certain wet areas will be considered for sanitary waste disposal within the drainage area means possible reduction of ground water storage. The possibility of contamination of drainage waters will reduce or eliminate stream and pond potential as recreation areas. It could be a source of contamination of domestic water supplies that are associated with a particular drainage area.

Flooding and Sustained Flows.

The increased development of land, the increased need for domestic water, the encroachment of the flood plains of the tributaries and the filling of natural storage areas, will increase the peak flows of the tributaries of the Neponset River and, therefore, the peak flows of the Neponset River. Below is a summary of the wetlands taken from topographic maps:

Upland Wetlands.

TOWNSHIP.	Per Cent of Total.	Acreage.
Quincy	1	100
Milton	3	192
Canton	26	1,635
Randolph	1	62

Stoughton	5	329
Sharon	18	1,085
Foxborough	5	333
Walpole	25	1,551
Medfield	5	362
Dover	3	186
Norwood	2	112
Westwood	6	397
Total	100	6,344

It should be noted that there is additional acreage of wetland in the flood plains of the tributaries, but in some instances, it does not show on the topographic maps. These areas would add to the total, but the total effect cannot be estimated.

In addition to wetlands, there are a number of natural and man-made ponds which also add to the total water storage capacity of the Neponset drainage. The following is the acreage of impounded water determined by the use of a dotgrid.

Upland Open Water.

TOWNSHIP.	Number of Ponds.	Per Cent of Total Acreage.	Acres.
Quincy	1	1	14
Milton	8	2	37
Randolph	2	6	104
Canton	20	23	407
Stoughton	8	3	60
Sharon	11	23	425
Foxborough	7	20	353
Walpole	33	16	297
Medfield	9	1	24
Westwood	4	3	39
Norwood	6	2	36
Total	109	100	1,796

Very little of the acreage shown here as Open Water of Upland Wetland, is in public ownership at this time. The Neponset Reservoir Company, made up of Kendall Company, Bird & Son, Hellingsworth & Vose and Tileston & Hollingsworth, control the Neponset Reservoir, Boyden Pond and Willet Pond.

The tributaries feeding the Neponset River are most important from the standpoint of storm drains, recreation, water supply, dilution water and as open space. The increasing pressure on existing wetlands for development, will mean that the tributaries will

have to carry higher peak flows with more constricted stream channels and flood plains. The chances of property damage and increased public safety and health problems, are great. Very little is being done to correct the problems now developing.

It is interesting to note that 6.2 million dollars have been spent by communities and state and federal agencies in the past ten years to protect against flooding. Although it was impossible to determine specifically, very little money has been expended to protect a natural drainage system by the acquisition of flood plain and wetland areas. Unless something is done on a drainage-wide basis, the streams of this drainage system will be subject to increasingly expensive flood protection measures. There is no question that additional flood protection measures will be needed, but these measures would be less expensive if some attempt was made to protect the natural storage areas.

There should be consideration of a study of the Neponset River drainage system by the U. S. Soil Conservation Service, due to the potential of storage in the uplands for flood control, industrial water, domestic water supply recharge and recreation. Following is a summary of possible impoundments, based on topographic map examinations. The acreages are based on the existing wetland. Work maps are on file with the Department of Natural Resources. As many of the topographic maps are not of recent making, and as no up-to-date aerial photographs were available, it may be found that many sites will have to be eliminated for no other reason than encroachment by development.

Possible Impoundment Sites.

TOWNSHIP.	Number of Sites.	Acreage.
Quincy	3	42
Milton	1	7
Canton	11	770
Randolph	—	—
Stoughton	7	177
Sharon	12	467
Foxborough	5	137
Walpole	12	1,264
Medfield	1	52
Dover	3	158
Norwood	1	76
Westwood	7	179
<hr/>		
Total	63	3,329

Due to topography, development or general unsuitability of site, an additional 70 sites were considered to be questionable. If we consider that all of the possible impoundment sites were developed, and that only one foot of water was to be stored temporarily, the minimum gallonage impounded would be 1.2 billion gallons.

If flood protection and industrial water were coupled with recreation water for boating, swimming, fishing, hunting, ice skating and ice boating, the values could be worth a great deal to the communities and the Neponset drainage area.

The protection of the tributaries of the Neponset River will have to become a co-ordinated undertaking of towns within the drainage. Unless there is a co-ordinated approach, downstream towns will suffer damage which will be reflected in increased tax rates, lowered property values and greater public health and safety hazards. It will also mean greater financial and technical aid demanded of state and federal agencies. Below are the sub-watersheds of the Neponset River and the towns which need to take co-ordinated action towards protection.

Sub-Watersheds.

WATERSHED.	Towns Involved.
1. Purgatory Brook (Plantingfield Brook).	Norwood, Westwood
2. Germany Brook	Norwood, Westwood
3. Hawes Brook (Mill Brook & Bubbling Brook)	Norwood, Walpole, Westwood, Dover.
4. Mine Brook (Mill Brook) (Medfield) and (Tubwreck).	Walpole, Medfield, Dover
5. Unnamed Brook (Enters north end of Cobbs Pond).	Walpole
6. Neponset River (Portion south of Elm Street, Walpole).	Walpole, Foxborough, Sharon
7. Spring Brook	Walpole, Sharon
8. Traphole Brook	Norwood, Walpole, Sharon
9. Unnamed Brook (Bullard Street to Fowl Meadow).	Sharon
10. East Branch (Massapoag, Devil, Beaver, Steep Hill, Redwing, York and Pequid Brooks).	Sharon, Stoughton, Canton, Randolph
11. Pecunit Brook	Canton
12. Ponkapoag Brook	Canton, Randolph
13. Pine Tree Brook	Milton, Quincy
14. Unquity Brook	Milton

Plantingfield, Traphole, Unnamed Brook (Sharon) and Ponkapoag Brooks, are typical of a serious problem. They lack adequate

upstream storage, have limited flood plain, have a moderate slope, and existing and future land development are encroaching on the flood plain and stream banks, thus adding to peak flows.

Upland Wildlife Considerations.

Many of the tributaries, such as Traphole Brook and Massapoag Brock, are stocked with trout by the Massachusetts Division of Fisheries and Game. Those ponds with public access, such as the Neponset Reservoir, provide a great need for increased leisure time activity. The towns open to public hunting provide a variety of game for the hunting public.

The encroachment on upland, as well as wetland areas, is rapidly removing this form of recreation activity for local people. Decreased stream flow, increased stream pollution, filling of wetlands and the reduction of suitable acreage by roads, residential and industrial development and restrictive community regulations, will alter this form of enjoyment for young and old alike.

Tidal Wetland Considerations.

At the mouth of the Neponset River are a series of tidal marshes. The greatest acreage is on the south side of the Neponset River, in Milton and Quincy. The following is a breakdown of tidal marshes by location:

Tidal Marshes.

TOWNSHIP.	Acreage	Location.
Quincy . . . 97		South of Neponset River between Hancock Street and Quincy-Milton town line.
Milton . . . 47		Milton-Quincy town line to Southeast Expressway.
Milton . . . 97		Southeast Expressway to Milton Lower Falls (south of river).
Boston 47		Granite Avenue, towards Milton Lower Falls (north side of river).

These tidal marshes are considered to be of high waterfowl value by the U S. Department of the Interior, Fish and Wildlife Service in their publication, "Wetlands of Massachusetts" (Revised 1959). These marshes provide a protected resting area for many ducks and other water-oriented birds.

These marshes are also the first relatively undisturbed wetlands of a marine nature that travelers on the Southeast Expressway can observe when traveling south. The marshes also provide a natural

separation between a "commercial" Boston side and a "residential" or "urban" side in Milton and Quincy. It is most important to maintain this separation from the viewpoint of property values.

Increased run-off from the Neponset River, if it were to coincide with excessively high tides, might increase the water levels along the entire tidal area from Milton Lower Falls to Hancock Street in Quincy.

The educational value of this marsh cannot be over-emphasized. Its proximity to local schools and to the many colleges and universities within the Boston area, make possible its use for study. The increased interest by public agencies in the marine environment, could make this an area for pure and applied research in a metropolitan environment.

RECOMMENDATIONS.

It is recommended that chapter 631, Acts of 1956, section 1 be amended to include the towns of Milton, Dedham, Westwood, Norwood and Canton, for the following reasons:

1. Interstate 95, upon its completion, will be a commercial and tourist route of prime importance. It will be linked with the large metropolitan areas of Rhode Island, Connecticut, New York, New Jersey and other states to the south. It will eventually be linked with states to the north and the eastern provinces of Canada.

- 2 This Radial Route, like the spoke of a wheel emanating from the Hub, is a means of presenting an Image of Massachusetts as Massachusetts would like to see an image presented *i.e.*, a combination of scenery which the Neponset River meadows and the Blue Hills would present, an expanding industrial complex tastefully developed, an urban area well cared for, a spectacular view of the changing skyline of Boston (including the Prudential Tower) and historic features of interest along the entire route.

3. It will effectively develop an open space separation of communities which will protect recreation, water and land values of all adjoining towns.

It is recommended that a study be made by the Massachusetts Department of Natural Resources as to the advisability of designating other major Radial Routes between Route 128 and the Massachusetts Bay Circuit as part of section 1, chapter 631, Acts of 1956. The following major routes might be considered in this study:

1. Routes 3, 24, 93, 95, 90 and 2 to their junction with Interstate 495.

It is recommended that the communities of Westwood, Canton, Sharon, Norwood and Walpole, the Norwood Airport authorities industrial groups and the Department of Natural Resources explore the possibilities of a co-operative venture in the acquisition of open space under Title VII of the Housing Act of 1961 in the Fowl Meadow from Route 128 to Sharon for the following reasons:

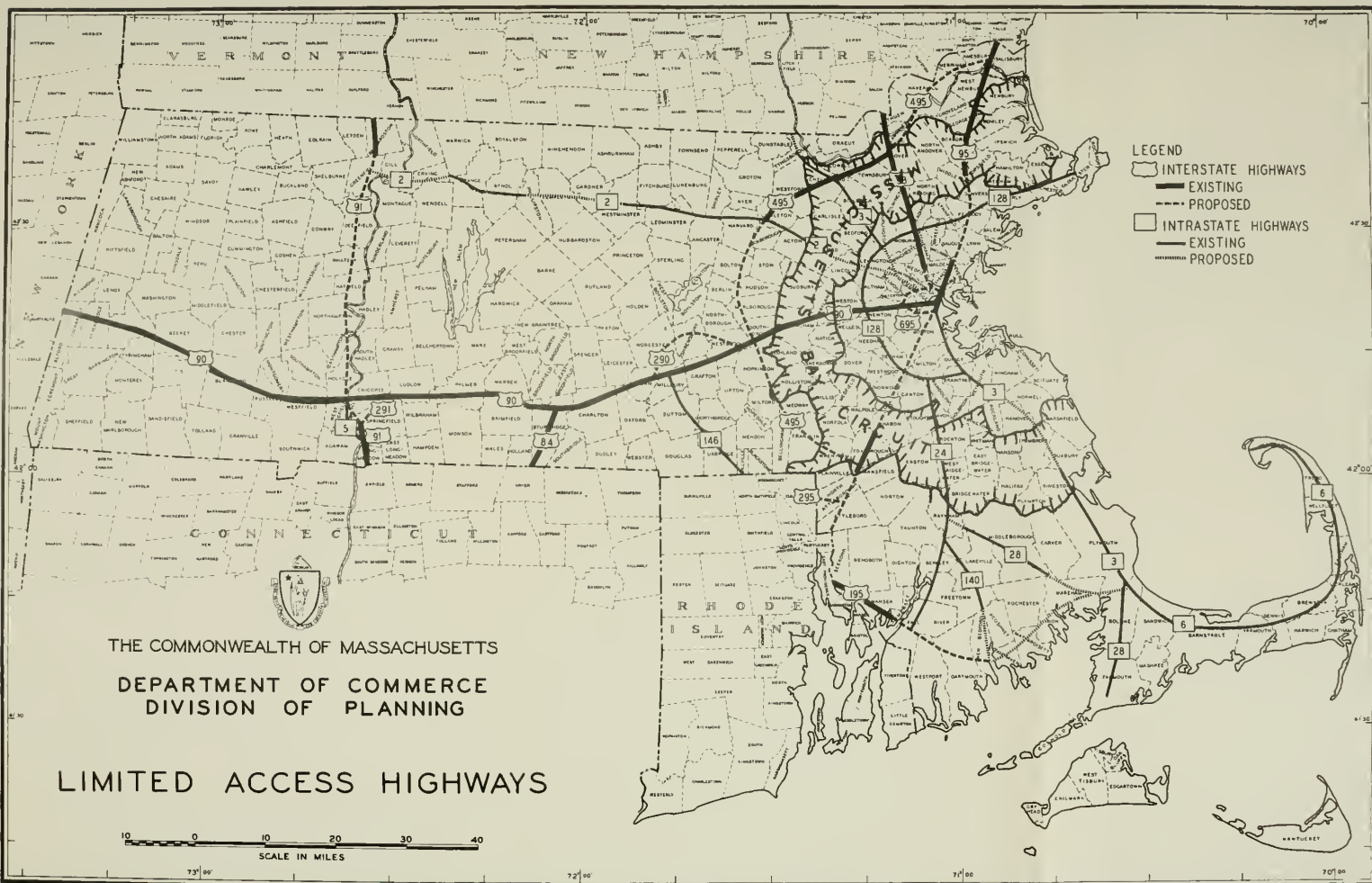
1. To promote the formation of distinctive, cohesive communities which can be served effectively by municipal services and facilities.
2. To define better the boundaries of metropolitan areas.
3. To preserve a natural environment near urban and suburban development for relief from extensive urbanization.
4. To protect distinctive geologic, botanic, historic and scenic sites.
5. To protect an area for recreation in a variety of forms.
6. To protect water supply, water storage and stream flow.
7. To minimize the damage from flooding.

It is recommended that a Memorandum of Understanding be developed between the Massachusetts Department of Natural Resources, the Metropolitan District Commission and the Massachusetts Department of Public Works relative to the following:

1. The retention of natural values for scenery, wildlife, water storage, water supply and open space in the construction of roads where Commonwealth and/or federal funds are a part of the costs of planning and development.
2. The retention and enhancement of natural values for scenic, wildlife, water storage, water supply, recreation and open space in the alteration of waterways where Commonwealth funds are a part of planning and/or construction costs.

It is recommended that sufficient monies be allocated to the Department of Public Health to develop pollution classifications for inter-community streams.

It is recommended that the Metropolitan District Commission acquire those portions of tidal wetlands on the south side of the Neponset River between the eastern boundary of the existing Neponset River Reservation adjacent to the Southeast Expressway and Hancock Street to protect public safety, to provide a natural division of communities, to provide a form of passive recreation, wildlife resting and rearing area, a natural science educational



area, to provide a marine research area and to protect a valuable scenic area of a marine environment.

It is recommended that a co-operative venture be explored by all communities in the Neponset drainage under the Watershed Protection and Flood Prevention Act, Public Law 566, 83rd Congress, as amended, to solve local water-management and flood prevention problems. This Act gives the Secretary of Agriculture the authority to give technical and financial aid to local organizations in planning and carrying out works of improvement for (1) flood prevention, (2) agricultural water management, including irrigation and drainage; (3) nonagricultural water management, including municipal and industrial water supply; and (4) recreational or multiple use considerations connected with impoundments.

It is recommended that communities within the Neponset drainage seriously consider the development of comprehensive soils studies by the U. S. Soil Conservation Service on a cost-sharing basis between the community and the U. S. Soil Conservation Service, or consultants qualified to undertake such studies.

Such studies will give the suitability of soils of the community for roads, gravel and sands, septic sewage disposal, industrial parks, housing and school sites and natural areas, and should precede any final zoning action by the communities concerned.

It is recommended that the establishment of Flood Plain or Conservancy Districts be explored by all communities within the Neponset drainage and that such districts be a co-ordinated undertaking of communities on any particular sub-watershed of the Neponset drainage. The establishment of such districts would protect water storage, water supply, public safety and other natural resource considerations of the entire sub-watershed.

It is recommended that the Norfolk Conservation District establish a regional committee of Conservation Commissions within the Neponset drainage to consider matters of a watershed nature.

It is recommended that those sections of Sharon, Norwood and Canton physically isolated by Interstate 95 and the relocation of the Neponset River be designated and acquired as natural areas. Such action would eliminate the problems of public safety and the high cost of providing services to such isolated areas.

It is recommended that the filling of wetlands for housing development or as sanitary land fill for waste disposal should be reduced to a minimum. The reduction of water storage, the possi-

bility of pollution and the destruction of natural values can only result in increased costs to the community.

A PROPOSAL FOR OPEN SPACE IN THE FOWL MEADOW.

Objective.

The objective of the proposal is to protect the Fowl Meadow for the purposes of flood protection, water supply, water storage, augmented stream flow, public health, industrial water, public safety, geologic, botanic and scenic sites, preservation of a natural environment near urban and suburban development, maintenance of the identity of communities and passive recreation opportunities.

Location of the Proposal.

The proposed Open Space area is an area south of Route 128 to the southernmost point of the Fowl Meadow in Sharon and Norwood. (See map.) Areas have been selected on the basis of the objectives already stated. All boundaries are based on the 50 foot contour or logical physical boundaries.

The following is a summary of approximate acreages by township that should be needed to develop the ultimate proposal.

Acreage by Location.

TOWNSHIP.	Location.	Acreage.
Westwood . . .	Route 128 to Dedham Street and east of railroad tracks.	51
Canton . . .	Route 128 to Dedham Street and west of Interstate 95	104
Canton . . .	South of Dedham Street to junction of river and Interstate 95 (west of Interstate 95).	140
Canton . . .	North of Neponset Street and east of Interstate 95.	70
Canton . . .	South of Neponset Street and east of Interstate 95.	212
Sharon . . .	East of Interstate 95	75
Sharon . . .	West of Interstate 95	162
Norwood . . .	West of Interstate 95 and south of Neponset Street.	147
Norwood . . .	East of Interstate 95 and south of Neponset Street.	4

Norwood	.	.	East of Interstate 95 and north of Neponset Street.	27
Norwood	.	.	West of Interstate 95 and north of Neponset Street.	403
Total	.	.	.	1395

The summary of total acreage by townships is as follows:

<i>Summary by Townships.</i>					Acreage.
TOWNSHIP.					
Westwood	.	.	.	.	51
Canton	.	.	.	.	526
Sharon	.	.	.	.	237
Norwood	.	.	.	.	581
Total	.	.	.	.	1395

Existing Public Ownership.

In the Fowl Meadow, Norwood owns approximately 70 acres for protection of their wells on Purgatory Brook. The Norwood Airport owns approximately 470 acres as shown on topographic maps. Canton owns approximately 16 acres as town forest south of Neponset Street. This acreage was determined for only that area below the 50 foot contour.

Proposed Method of Acquisition.

It is suggested that consideration be given to a co-operative venture of industry communities, Norwood Airport authorities and the Massachusetts Department of Natural Resources. The Open Space Program under Title VII of the Housing Act of 1961 should be explored as a means of defraying the expense of acquisition by possibly 30 per cent.

A possible suggestion of co-operative acquisition might be for Canton to acquire those lands south of Neponset Street to be added to the town forest, Sharon to acquire that land east of Interstate 95, Norwood to acquire those lands south of Neponset Street and west of the junction of Neponset Street and Traphole Brook, the Norwood Airport authorities to acquire those lands necessary to protect an expanded airport including the glide paths for aircraft and for noise abatement and the Department of Natural Resources to co-operate with industrial groups and all towns to acquire those lands to be isolated by dredging and those lands adjacent to the Neponset River of general public concern.

Scenic Values.

The acquisition of this area would protect the scenic value of 6.3 miles of Interstate 95 from Sharon to Milton Street in Milton.

Stream Relocation.

It is suggested that consideration be given to the relocation of the East Branch for the purpose of straightening the river for flood protection. Its relocation to the south would add approximately 47 acres to the industrial land south of Neponset Street. The relocated length would be 2,000 feet or 2,600 feet less than now exists.

Existing Industry.

Those industries existing as of this date, within the proposed open space area, should be exempt from any proposal for acquisition.

Need for Action.

Action on such a proposal should be immediate. It is estimated that total industrial development could occur in 7 to 10 years.

Respectfully submitted,

BRUCE S. GULLION,
Director, Division of Conservation Services.



PROPOSED FOWL MEADOW LAND USE

- PROPOSED EXTENSIONS
- PROPOSED INDUSTRIAL AREAS
- PROPOSED OPEN SPACE BOUNDARY
- PROPOSED STREAM RELOCATION
- GLIDE PATH

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